ROCKS and MINERALS

42

A Magazine for Mineralogists, Geologists and Collectors

Official Journal of the Rocks and Minerals Association

November, 1941

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THE ROCKS AND MINERALS ASSOCIATION

(Members All Over the World)

Organized in 1928 for the increase and dissemination of mineralogic knowledge

To stimulate public interest in geology and mineralogy and to endeavor to have courses in these subjects introduced in the curricula of the public school systems; to revive a general interest in minerals and mineral collecting; to instruct beginners as to how a collection can be made and cared for; to keep an accurate and permanent record of all mineral localities and minerals found there and to print same for distribution; to encourage the search for new minerals that have not yet been discovered; and to endeavor to secure the practical conservation of mineral localities and unusual rock formations.

Ever since its foundation in 1928, the Rocks and Minerals Association has done much to promote the interest in mineralogy. It has sponsored outings, expeditions, formations of mineralogical clubs and the printing of many articles that have been a distinct contribution to mineralogy.

Those of our readers who are members of the Association can rightly feel that they too were sponsors of these many achievements that have helped to give mineralogy a national recognition. Among your friends there must be many who would like to have a part in the Association's work—to share with you the personal satisfaction, the pleasure, and the benefits of membership. Will you give your friends this opportunity to join the Association by nominating them for membership?

Each new member helps to extend the Association's activities—helps to make your magazine larger, better, and more interesting, and above all assists in the dissemination of mineralogical knowledge.

Some advantages of memberships: All members in good standing receive:

(1) **Rocks and Minerals**, a monthly magazine. (2) A member's identification card that secures the privileges of many mines, quarries, clubs, societies, museums, libraries. (3) The right to participate in outings and meetings arranged by the Association. (4) the right to display a certificate of membership and to place after their names a designation indicating their membership or to advertise membership on stationery, etc. (5) The distinction and the endorsement which comes from membership in the world's largest mineralogical society.

Mineralogical clubs which subscribe for **Rocks and Minerals** also become affiliated members of the Rocks and Minerals Association and enjoy all the advantages which such an affiliation affords.

A number of clubs hold membership in the Association, participate in the annual outings, and co-operate in many ways in furthering the aims and ambitions of the Association.

Affiliation with the world's largest mineralogical society cannot fail to increase membership, enlarge circles of acquaintanceship, and stimulate a keener interest in mineralogy.

A list of affiliated clubs will be found among the back pages of the magazine.

Rocks and Minerals

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The Official Journal of the Rocks and Minerals Association

Chips From The Quarry

THE PASSING OF A NOTED MINERALOGIST— JAMES F. MORTON

(October 18, 1870 — October 7, 1941)

It is with much sorrow that we have to announce the tragic death of one of America's most noted mineralogists, James F. Morton, Curator of the Paterson Museum, Paterson, N. J. Mr. Morton was a nationally known mineralogist, member of many clubs, including Rocks and Minerals Association (since March 30, 1927), and a warm friend of the Editor of *Rocks and Minerals*.

Mr. Morton was also noted for his fondness for long walks which sometimes extended for as many as 25 miles in a single day. On the evening of Monday, October 6, 1941, when out on one of these customary walks, he was hit and fatally injured by an automobile in Totowa Borough, Paterson. He died at 6:15 a.m. Tuesday, October 7th.

During the 15 years that we had the good fortune to know him, we had always found him a most friendly and courteous gentleman, a true friend, and that type of mineral collector who seemed to enjoy going out of his way to be helpful to other collectors. Because of his graciousness and warm hearted assistance, we called upon him frequently for help, either to take charge of outings in his area, for information on minerals and localities of northern New Jersey, or for identifying those unusual minerals from Paterson and vicinity of which he was an authority.

The Paterson Museum under his guidance has achieved a most enviable reputation not only for the wide varity of priceless material on display but especially for its large and very fine mineral collection which in 1933 consisted of about 8,000 specimens covering over 750 recognized definite species with many varieties and varied types. In 1933 a fair value on the mineral collection was estimated to be $25,000. Since that time the collection has been greatly enlarged and improved. His aim was to build up a superlative general collection with the widest possible range of species and types. His great specialty was that of New Jersey minerals: 1st—those of Paterson, 2—those of Franklin, 3—those of the greatest number possible of other New Jersey localities. So friendly, genial and courteous was Mr. Morton, that collectors from all over the country not only called to meet him and to inspect the minerals on display but very frequently donated choice specimens to the collection. The fluorescent exhibit at the Paterson Museum has been voted the finest in the world by many collectors who have seen it.

Mr. Morton was 70 years old at the time of his death. His wife, the former Pearl K. Merritt, survives.

Peter Zodac

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VALLEY OF ROMANCE
OR
STORY OF THE YOSEMITE VALLEY

By CLARK HARRISON

Last year (1940) more than half a million persons, from every state of the Union and 17 foreign ccountries, visited Yosemite National Park in Mariposa county, California, enjoying its unrivaled grandeur and beauty, its towering cliffs of granite, delightful climate, sublime waterfalls and its stately trees—some of them being considered among the oldest living things on earth.

The origin and development of the Yosemite is just as romantic and inspiring as the scenic marvels this world-famous place presents today. Once the ocean floor, then rolling, low hilly country, enjoying a long period of quiet; then upthrusting, which formed high rugged mountains, with centuries of stream-cutting; then the carving of glaciers; and, today, Nature is still carving, leveling and changing this great natural wonder of America—second only to the Grand Canyon.

True, the rockhound will not find any important minerals here for his collection. But these may be found only a few miles away, in the valley below, and along the flanks of the Sierra Mountain ranges. The true mineralogist, however, is a student of geology and nature; and here one may study the romance and history of geologic formations to his heart's content. I am not advertising any particular region. I merely want to describe a wonderful place so that those of you passing by there will not pass up the thrill of a lifetime. I have camped there many vacations, and I never get tired of it; it is always new; I shall not forget its marvels. No wonder John Muir, lover of nature and writer extraordinary, who made the trails he trod come to life under his subtle pen, loved the Yosemite more than any other part of the world.

Yosemite Valley, 100 miles east of San Francisco, contains 8 square miles, being approximately one by eight miles long. It is a part of Yosemite National Park which contains 1176 square miles or 752,904 acres. This became a national park in 1890, and is a part of the Sierra Nevada mountain range, the latter being about 80 miles wide and 400 miles long, and lying in a direction slightly northwest to southeast. This is the highest, longest and grandest single mountain range in the United States. It is a part of the Rocky Mountain system (or more properly, the Cordilleras), which runs from Alaska in Mexico along the Pacific Coast. In the southern part of the Sierra Nevada is Mt. Whitney, 14,496 feet high—highest point in the United States; while less than a hundred miles to the east, just outside the Sierra, is the lowest point in the nation—Bad Water lake in Death Valley, 279 feet below sea level. The Sierra is very mountainous and contains a two per cent drop in elevation from its eastern edge to its western flanks which front the Great Valley of California. This drop gives the streams plenty of cutting power.

GEOLOGICAL HISTORY

Millions of years ago Yosemite was the floor of the Pacific Ocean, the latter extending eastward past the Rocky Mountain states. Some 20,000,000 years ago, during the Miocene Age, or about the middle of the Tertiary period, the country between the present Pacific coast and the Rocky Mountains began to bulge up due to internal disturbances of the earth. This upheaval was slow and intermittent, causing the earth's crust to warp and bend. Low mountain ranges and intermediate plains were formed, the ocean receding westward. Long fractures or faults occurred in many places and there was slippage of crust blocks past each other, the mountain blocks rising while the valley blocks sank or remained low. Such movements may be well traced on the east side of the Sierra block.

Then a long period of quiet followed these earlier tiltings, while the Merced river meandered sluggishly through a broad, nearly level valley, surrounded by low, rolling hills and a few ridges up to a thousand feet high, covered with heavy semi-tropical vegetation. One of these rolling hills was El Capitan, whose rounded summit rose 900 feet above the river (today it rises 3,000 feet above the river). By the end of the Tertiary period this river had cut a V-shaped gorge into the granite nearly 1,000 feet deep.

In the years that followed the quiet period, a series of successive thrusts pushed the eastern edge of the Sierra block up to a height of 16,000 feet above the level of the sea, deflecting the drainage westward towards the ocean. Before this, the streams ran in diverse directions, but now they roughly paralleled each other in westerly directions.

The small side streams which fed into the Merced river were hardly steepened by the Sierra block tilting, as they ran more at right angles. Therefore, they did not cut or entrench as fast as the Merced, and soon, with the Merced cutting deeper, steadily, due to its increased steepness, there were formed hanging side valleys, with their streams cascading over the valleys' lips as falls. About this time Yosemite Falls was a broken cascade 600 feet high (today it is 2566); Bridal Veil and Sentinel creeks plunged down 900 feet; Ribbon creek 1400 feet and Meadow brook 1200 feet.

In the early part of the Quaternary period (last great geologic division which includes the Ice Age and extends to the present time) the last and greatest uplift of the Sierra occurred, lifting it to its present height. The velocity and cutting power of the Merced river was increased until it became a mountain torrent. Originally, this river had been wider and slower; but by the end of the Tertiary

The north fork of the Merced River as it flows thru Happy Isles, Yosemite Park.

period the tilting had so speeded it up that it had left its old banks high and dry by cutting down deeper, its width decreasing. Thus, a two story valley was formed. Now, with this final upthrust the river had been speeded up still more, and again it left its banks and cut its gorge deeper, leaving a three story valley. The Merced still flows from the lower end of the Valley to the foothills in this inner gorge. This last gorge attains its greatest depth (about 2000 feet) at El Portal, while the three story canyon, as a whole, is about 3500 feet deep.

Each time that the Merced created a story valley it also acquired another set of hanging valleys, whose streams cascaded over into the main valley. (A relief map in the Rangers' headquarters illustrate these changes). The valleys of Indian creek and Illilouette creek belong to this group. Some of the streams that flowed into the Merced were able to keep pace to some extent. Tenaya creek was one of these. This was because it flowed in a southwesterly course (direction of tilting and fracture) and was underlaid by fractured rock, thus allowing it to entrench deeply. Another was Bridal Veil creek whose direction was less towards the direction of tilt, and therefore did not cut so deeply.

At this time the three story canyon of the Yosemite was about 2400 feet deep—no wider at the bottom than the Merced river, winding around sharp, rocky crags; while leaping falls adorned the sides as Illilouette creek falling 600 feet, Yosemite creek 1900 feet and Ribbon creek 2400 feet.

During the Quaternary period came the great Ice Age, probably caused by a certain inclination of the earth's axis (another ice age is expected 10,000 years from now). Snow gathered 2000 feet deep in the canyons of the upper Sierra Nevada, compacting into glaciers, some of which were 2000 feet thick, and extended for miles down the canyons. One glacier coming down the Tenaya canyon, another down the Little Yosemite canyon, converged in the Yosemite canyon, filling it up to the brim, and reaching down to El Portal. Ice invaded Yosemite three times. Where the Yosemite canyon had been V-shaped before, the ice now hollowed it out to the characteristic U-shape it retains today. The steps of Bridal Veil Gulch were cut away leaving it as a hanging valley. Little Yosemite canyon being underlaid by more solid and massive granite than Tenaya canyon was not cut down so much, and today, is about 2000 feet higher than Tenaya.

Next, the climate grew warmer and the ice began melting. A terminal moraine formed just below El Capitan, backing up debris and ice behind it, which then formed a delta. Terminal moraine material may be seen today at this point. Ancient Lake Yosemite was formed and gradually filled with sediments brought down from above, finally building up the level valley of today. Rangers have drilled down 1200 feet only to remain in the sediments. The Ice Age ended 20,000 years ago, but Nature is still at work, carving down the canyon walls, while the Merced is cutting its bed deeper.

HOW TO REACH THE VALLEY

Three roads lead into the valley. The Big Oak Flat-Tioga Pass road comes in from towards Sacramento, as well as one fork coming in from Owens Valley on the east. The All-Year Highway comes in from the small city of Merced, from the west; while the Wawona road comes in from the south, from Fresno. I would advise entry from Merced, and departure by Big Oak Flat and Tioga Pass. The first glimpses gained by this procedure will burn in your memory forever. June is the ideal time to visit before streams get low.

SOME GEOLOGICAL WONDERS OF THE VALLEY

Entering the valley one notices the sheer profile of the majestic cliff, El Capitan, rising 3000 feet above the valley floor (7564 feet above sea level). On the other side of the valley stand the three Cathedral Rocks, and to the right, Bridal Veil Falls leaps 620 feet off the jutting promontory, to fall in glorious spray on the granite boulders below.

Farther up on the right are the Cathedral Spires, tall slender shafts piercing into the sky. Beyond is a pointed top obelisk —Sentinel Rock. On the left, with gabled tops rising one above the other, are the Three Brothers, the highest, Eagle Peak, rising 3800 feet above the valley.

Farther up on the left is the world-famous, booming, misty Yosemite Falls, leaping down 2565 feet in three drops, the first falling 1430 feet. Beyond this are the Royal Arches, sculptured dome-like shells (and it seems that you are viewing them from the inside out). Farther, a natural granite pillar, Washington Column, rises 1952 feet above the valley floor. Back of this is a majestic, dome-shaped boss of granite, North Dome, reaching up 3500 feet. On the right is a 3200 foot promontory, Glacier Point. A trail, as well as an automobile road, leads up to this point, which commands a beautiful, sweeping view of the upper Valley and Sierra beyond. At the head of the valley, Half Dome rises to 4850 feet. There never was a rounded half to this structure, as many think. It is part of a huge mountain of rock containing fractures at a point where Tenaya canyon is today. The fracture near Half Dome being smooth and deep on the Half Dome side with solid granite in back of it that would not cut or erode away is why it has this appearance. These so-called domes aren't domes at all, geologically speaking, but are batholiths—igneous material that bulged towards the crust but did not have enough force to burst through. The reason that these helmet-shaped batholiths remain round is that granite, when eroding, tends to flake off in concentric shapes.

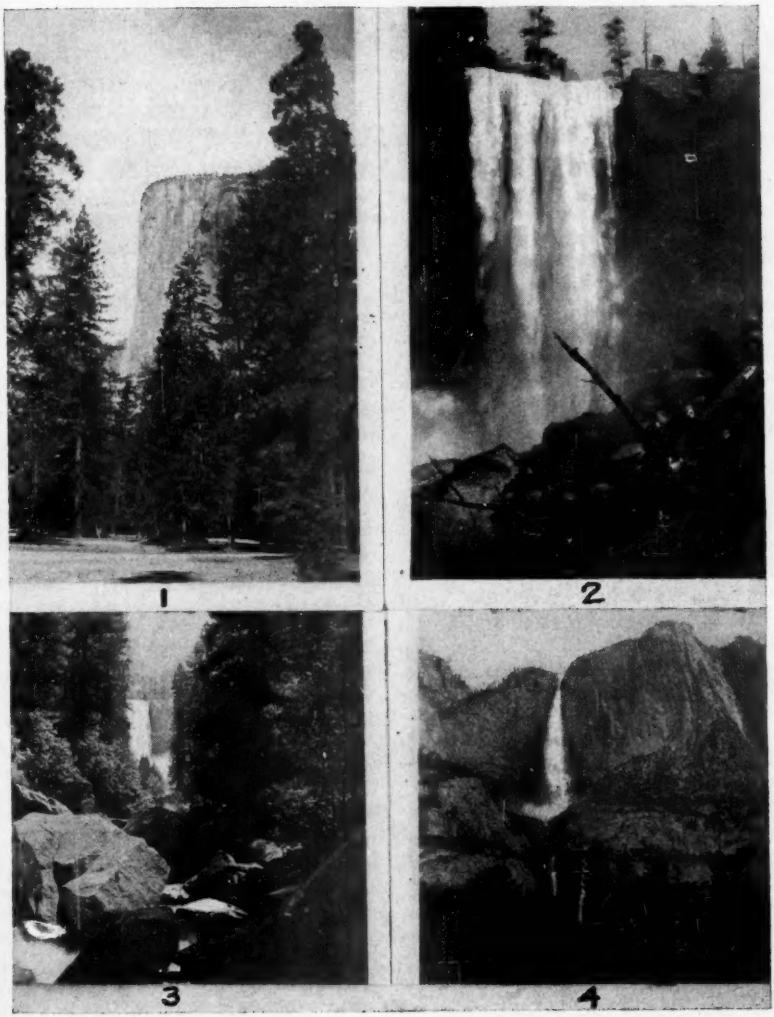
At the foot of Half Dome a landslide dammed up Tenaya creek, creating romantic Mirror Lake, its placid waters reflecting the awe-inspiring scenery. Beyond Half Dome is the loftiest summit near the Valley—Cloud's Rest, reaching up into the clouds 9929 feet. And beyond this is a stretching view of the High Sierra with its jagged peaks culminating in ice-covered Mt. Lyell, 13,090 feet high. On the right side, past Glacier Point, the Merced river climbs up the rocky gulch towards Little Yosemite Valley, forming two beautiful cataracts—Vernal Falls, with a 217 foot drop, and Nevada Falls, which plunges over a precipice 594 feet. To the extreme right is Illilouette Falls, with a 370 foot drop.

At first the Yosemite crust was made up of sedimentary rocks. Later, during the greater upheavals, volcanic craters (Mt. Lassen a few miles to the north may still be seen today along with others that demonstrate this) covered the area with molten (igneous) lava, while much of the material which could not break through pushed up underneath the sedimentary layer, compressing it under great heat. This created metamorphic rocks. In most places, today, erosion (the great leveler) has worked the metamorphic layer, leaving the igneous material exposed, which cooled into granite during the Tertiary period. Metamorphic indications such as slate, gneiss, chlorite, etc., may be found in parts of the Valley. It is possible that there were some important minerals after the igneous intrusions, but if there were, erosion carried them down into the San Joaquin Valley and the Mother Lode country. And the Mother Lode country not far away is famous for its rich gold bonanzas.

YOSEMITE VALLEY NOT MINERALIZED

Therefore, Yosemite is not a mineralized district, from a miner's standpoint. Generally speaking, it is of little use to look for valuable ores in coarse grained, dark, crystalline rocks such as large granite boulders, showing a solid or massive condition. One must look where dikes occur between the granite and limestone, or in light-colored, acid rocks, preferably of fine grained crystalline composition. Of course, there are exceptions to all rules. Only recently, tin has been found in lava formation near Burns, Oregon. Also, nickel has been found near Humboldt, Nevada, recently, in an unusual formation.

There are rich deposits of gold, silver and other ores all around the Sierra block. The strip of country between the Great Valley of California and the western



Scenes in Yosemite Park

1—El Capitan, 7564 feet above sea level and about 3604 feet above valley.

2—Vernal Falls (close up view).

3—Vernal Falls as seen from a distance.

4—Yosemite Falls—total of three drops. 2565 feet.

flanks of the Sierra is the Mother Lode country—famous for its gold since '49. On the east are the highly mineralized areas of Owens Valley and Nevada. The Mohave Desert and Death Valley to the south and east; while the area to the north has any number of minerals and mines. The Mother Lode country on the west reaches almost to El Portal, within 20 miles of Yosemite Valley. Below Mirror Lake is Iron Spring, its waters leaving an iron-rusty appearing sediment on everything it touches. It has been suggested that the water is leaching through an iron deposit. But considering the granite formation, it may be only an organic deposit of some kind instead. At the foot of Yosemite Falls I found some altered chlorite embedded in some of the huge granite boulders.

HOW THE VALLEY WAS DISCOVERED

The first white men to see the Valley was Major J. D. Savage and his Mariposa Battalion of the California State Militia, on March 25, 1851, when, while pursuing marauding Indians, they came out of the forest at Inspiration Point and beheld the Valley at their feet. Camping that night in the Valley they named it Yosemite, thinking that was the name of the Indian tribe that lived there.

More than forty villages of different tribes of California Indians, peaceful for the most part, lived there, the Miwok tribe being one of the most important. Yosemite, in their language, meant "Grizzly Bear". And there are still plenty of bears (mostly brown bears) there today. Each night they are fed at the pits where tourists may see them.

Some two months later another expedition was sent into the Valley under Savage to punish marauding Indians. In May, 1852, Lt. Moore, with U. S. Cavalry, entered the Valley in pursuit of the criminals. In 1855, J. M. Hutchings wanted information about the Valley for his California Magazine. With four men he entered the Valley, explored it, and returned with glowing accounts of this wonderland. The first pioneer to make his permanent home in the Valley was James C. Lamon in 1859. John Muir, great Scotch naturalist and geological authority, explored the world on foot, chosing Yosemite as his favorite spot. His books aptly describe the Sierra and its regions.

YOSEMITE VALLEY A NATIONAL PARK IN 1890

In 1890 Yosemite became a park. Since then hundreds of thousands of persons, from all over the world and including many famous celebrities, have visited the park. In 1940 a total of 506,781 people, from every state in the Union, as well as 17 foreign countries, visited Yosemite. The foreign countries represented were Canada, Mexico, Panama, Canal Zone, Philippines, Cuba, West Indies, England, Samoa, Puerto Rico, Belgium, France, Salvador, Holland, Ecuador, Venezuela, Chile and Brazil. Ninty-five per cent of the visitors came by private car, and 154,587 cars entered the park. California led as to visitors; the next six leading states in their order were (1) Illinois, (2) Texas, (3) New York, (4) Ohio, (5) Michigan, and (6) Washington. The record travel day in Yosemite history was July 4, 1936, when 11,512 visitors and 3,391 cars entered the park. On July 4, 1940, the free campgrounds in the Valley had 8952 campers.

Yosemite has much to offer besides the field for geologic study. One reason why it is world-famous is that it has so much to offer within so small a compass. Another is the magnitude of everything. It is ideal for camping and other forms of recreation. It has a delightful climate—camping weather in summer and alpine weather for winter sports. Deer are plentiful, so are birds. While it is well forested with redwood, pine and hardwoods, there are beautiful meadows. It has camp grounds, hotels, restaurants, movies and other nightly entertainment; swimming, tennis, horseback riding, fishing, hiking and bus tours; bicycling, feeding the bears, wigwams and Indians, postoffice and Ranger information service; telephones and telegraph, museum and library, daily lectures on geology, etc., lakes, river, leaping falls (probably the

highest free leaping falls in the world), and the famous awe-inspiring spectacle —the Firefalls—each night at nine. I know of no place where one may relax and rest, and yet not be lonesome. And you may pitch your tent right by the rushing, roaring waters of the Merced river—John Muir's "most songful river in existence."

QUICKSILVER AND ANTIMONY DEPOSITS OF THE STAYTON DISTRICT, CALIFORNIA

The quicksilver and antimony mining district that centers in the Stayton mine, in Merced County, Calif., has been examined by geologists Edgar H. Bailey and W. Bradley Myers, of the Geological Survey, United States Department of the Interior, as part of the Geological Survey's investigation of domestic deposits of strategic minerals. The district is about 13 miles northeast of Hollister and includes parts of Merced, San Benito, and Santa Clara Counties. It has produced about 1.700 flasks of quicksilver, mostly between 1870 and 1880, and a few tons of antimony ore.

The district is occupied mainly by Tertiary igneous rocks, which include basaltic flows and tuffs, andesitic agglomerates, and several bodies of andesite and rhyolite that have been intruded into those volcanic rocks. Older rocks, including Franciscan serpentine and Cretaceous (?) sedimentary rocks, are exposed in a few places.

The ore bodies occur in the basaltic flows and tuffs along north-striking faults and near the crest of a north-trending anticline. The andesitic agglomerate, which unconformably overlies the basaltic rocks, is unmineralized, and the intrusive bodies have no direct genetic relation to the ore.

The antimony ore mineral is stibnite, which has been deposited with quartz in fissures and has partially replaced the brecciated rock along the fault zones. The mineralized bodies of breccia have an aggregate length of more than 3,000 feet; most of them are only a few feet wide, but a few are as much as 30 feet wide for short distances. The breccia contains, on the average, less than one percent of antimony, and ore of this low grade cannot be mined profitably at present, except possibly by large-scale methods. Lenses or pods of pure stibnite, a few feet long, occur in the breccia, and these rich lenses, as well as the parts of the breccia bodies in which lenses are abundant. can be mined profitably, but careful prospecting is required to locate the lenses. The low-grade breccia contains several thousands tons of antimony.

The valuable quicksilver mineral is cinnabar (mercury sulphide). Three types of quicksilver deposits have been mined in the district: (1) Veins and impregnations in fractured antimony veins, (2) veins in otherwise unmineralized basalt, (3) veins and impregnations in silica-carbonate rock derived from serpentine. The more productive ore bodies are along the easternmost broken antimony veins and in basalt immediately below the andesitic conglomerate.

The reserves of the five largest quicksilver mines in the district are estimated to be more than 1,000 flasks of quicksilver. The largest mine, the Stayton, is probably capable of producing nearly 100 flasks a year for a few years. Additional deposits of medium-grade ore might be uncovered by further prospecting along the broken antimony veins in the basaltic rocks below the overlying andesitic agglomerate. Another potential ore body of large size but averaging only about 2 pounds of quicksilver to the ton is partly exposed in the western workings of the Stayton mine.

A PYRITE LOCALITY IN SAYREVILLE, N. J.

By VINCENT GIORDANO

During the past spring I made a number of trips to the clay pits of the Raritan Valley around Sayreville, N. J., to hunt for pyrite and marcasite concretions. We visited one pit where the year before we had found a number of specimens but this year it was barren of minerals. While there we met a young man who asked us what we were looking for. On being told it was pyrite he said, "O, you mean sulphur." He then directed us to another pit where we found good specimens of both pyrite and marcasite. Believe me it was hard work digging them out of the wet clay.

Another trip was made to the locality (Quigley pit) in July accompanied by John Albanese and his son, Jack, both of Newark, N. J. Six men were working in the pit on our arrival. I asked the one in charge if we could collect some pyrite and his reply was "Help yourself." He told us that they were throwing away the pyrite so that we could have all we wanted. We picked out the best ones from the waste pile but decided it would be more fun to dig for them.

They had cut down one side of the pit so that it resembled a high vertical wall, and studded in the clay were many pyrite and marcasite concretions. We dug out all we wanted and still there were many left. When I arrived home and washed the clay off of them, which was quite a job, the amount of specimens collected measured one-half bushel.

On September 7th, another trip was made to the locality when we found our widest variety of specimens. The party consisted of five collectors, (the two Albaneses, O. W. Bodelsen of Mt. Kisco, N. Y., Peter Zodac of Peekskill, N. Y., and the writer).

Location

Sayreville is a village of about 10,000 population in the central part of Middlesex County which county is approximately in the center of the state. The Quigley pit is in the southern part of the village and is at the end of Winkler Ave., which runs north off Washington Road. Winkler Ave. is a dirt road, about 1200 feet long, which begins at Washington Road and ends at the clay pit. Winkler Ave. is the 3rd street to the right from the bridge (0.6 miles) over the South River, between Sayreville and the village of South River.

Mineralogy

The Quigley pit is a huge excavation about 1500 feet long (east and west), 800 feet wide (north and south), with banks 75 feet high on the west face. Near the west face a pond 700 feet long and 200 feet wide is present in the pit; apparently this represents a worked out section which was allowed to fill up with water. A railroad track hugs the walls of the pit coming from under a railroad bridge on the east side.

History

Just when the pit was opened up and by whom we do not know but from obliging natives we learned that the property belongs to the New Jersey Clay Products Co. whose plant adjoins the pit on the east. The main product, the vari-colored top clay, is worked by the Quigley Company whose plant can be seen about a mile north of the pit where it is manufactured in to refractory products. The lower blue clay is retained by the New Jersey Clay Products Co. who manufacture it in to tile.

Mineralogy

The following are the minerals that we found in the pit:

Hematite: Reddish earthy masses and stains on surfaces or insides of limonite geodes.

Kaolin: Common as grayish-white masses in the clay.

Lignite: Fairly common as black masses which when in small pieces resemble charcoal. Large masses show the checked woody structure and are often heavy due to inclusions of pyrite or marcasite.

Limonite: Small dark brown pebbles noted in the clay.

Limonite (Geodes): These are quite common but those seen were all broken whose thin to thick shells were of rough texture. Sometimes small quartz pebbles were cemented to their surfaces; hematite often replaces the limonite on one side of the shell. From the appearance of the shells it is apparent that complete geodes must be present and that they often are of the type known as "rattle boxes" (rattle when shaken due to the presence of loose sand in the interior).

Limonite (Ocher): Small yellow earthy masses found in the inside of limonite geodes.

Limonited Wood: Some very fine specimens, dark brown in color, and with a smooth interior texture, were found. So fine grained were some of them that at first they were thought to be petrified; at least they should take a good polish.

Marcasite: Common as small to large warty concretions; dark gray in color, and not very attractive. They are present in rounded or elongated masses and occur embedded in the clay, commonly with the pyrite.

Tiny spearhead crystals of marcasite pale bronzy in color, were also common embedded in a grayish clay. These crystals were about ½ inch long, ¼ inch wide and had sharp faces. It required keen eyesight to spot them but once a few were found others were easy to obtain as they occurred in a clay slightly different from the rest.

Melanterite: Common as white efflorescences on altered pyrite or marcasite and especially noticeable on the black lignite.

Pyrite (Sulphur Balls): Especially common and in very good quality if they can be successfully cleaned and coated with a preservative against deterioration. For beauty and gorgeousness, the Sayreville pyrite has no equal. The mineral occurs in rounded masses of crystallized concretions known as "sulphur balls." These vary in size from small ones 2 inches or less in diameter up to those 5 inches or more. The individual crystals are cubic and vary in size from tiny up to ½ inch on the side—they are very lustrous. The sulphur balls consist of two distinct group of crystals—an inner core made up of tiny drusy crystals which frequently disintegrate—and an outside crust made up of large and lustrous crystals which are not only of far better quality but are not so easily decomposed. Quite often the outer crust can be lifted from its inner core and when this happens in a cabinet the inner core should be thrown away as it is an indication it is decomposing.

After a good cleaning, I give my pyrite specimens a coating of Canadian balsam and xyol.

Quartz: The following small pebbles were noted in the clay: brown jaspers; yellow jasperoid quartz; ferruginous quartz; and smoky quartz. Some of these pebbles were also seen adhering to geodes.

Editor's Note: See Sept. 1941, *Rocks and Minerals*, p. 335, and this issue, p. 419, for methods on preserving marcasite and pyrite which deteriorate easily.

The Army Has Its Advantages

The following is an excerpt from an interesting letter from a member of the Association whose home is in Harrison, Ohio. It speaks for itself.

"Even though I have been in the army for six months I have always been near enough home so that I could return on leave and enjoy *Rocks and Minerals*. There is one advantage in being in the Army, as far as a collector is concerned, as one gets about the country and has a chance to visit mineral localities. Our outfit is located in Michigan at present so I hope to visit the northern peninsula before the weather turns too cold. So you see the army is good for something else besides fighting."

—Clyde C. Campbell.

GOLD DEPOSITS OF PORTO RICO

By HORATIO C. RAY
Bureau of Mines
San Juan, Porto Rico

GOLD PLACERS

Practically all the streams of the central volcanic backbone of the Island contain placer gold, but since most of these streams flow through very narrow valleys, almost ravines at times, the amount of gold-bearing gravel is necessarily small. There is certainly not enough to form the basis of any considerable washing project. Most of the gold is concentrated in the general vicinity of the following sections: Barranquitas-Naranjito-Corozal; Luquillo Forest Reserve and San German.

Of course it is possible that drilling might develop large dredgeable deposits in the lower parts of the rivers draining these areas where the valleys are quite wide and the alluvium of some depth. However, this remains problematical as no drilling has been done except for a few pits which did not reach bed-rock, to show the presence of some gold.

In the vicinity of Barranquitas, on the head-waters of the Rio La Plata, there has been drilled and estimated a considerable deposit of a gold-bearing clay arising from the altering in place of andesitic rocks. Due to the resistance of the clay there has been little concentration and the values extend at times for a considerable distance from the streams. The difficulty of puddling this clay has been an obstacle in its commercial exploitation. However, recently the Bureau of Mines has run two series of tests with a washing device which gave great encouragement, and the New York capitalists which did the development are now working on the problem, and it is hoped that an installation will soon be made. There is reason to believe that similar deposits exist elsewhere in this region and also near Corozal, especially in the Palo Blanco township.

Porto Rico has a record (governmental) of a considerable production of placer gold during the early days of the Spanish regime. Records seem to show that most of this gold came from near Corozal, Naranjito, and San German. However, it was probably taken under conditions that could not be duplicated to-day even if the gold were available. Such statistics are of little value except to show the possibilities of virgin ground if same can be encountered and is the only favorable argument for drilling the lower reaches of the big rivers.

GOLD MINES

In the vicinity of Barranquitas there is at least one gold-ore vein which shows promise. It is a wide quartz vein with a maximum width of about 10 feet, but with low values—about $6.00 to $12.00 per ton. The vein is quite consistent in width and can be traced along its outcrop for at least 500 yards. It has been developed only by a few pits along the outcrop and a short tunnel (about 35 feet long) and a winze (about 16 feet deep). Values were obtained in all of these workings but most of them near the lower figure given above. The gangue is quartz mixed with considerable oxides of iron. This deposit is controlled by the same company who has the placer ground above referred to, who would probably be willing to make some arrangement for its exploration.

There have been many small veins discovered in the general vicinity of Corozal, but most of the work has been done on the Sayre farm in the Negros township. Mr. Sayre sunk several shallow shafts and did some tunneling, but much of the work was ill-advised and his small capital (also wasted elsewhere) was soon exhausted. Later some people from New York re-opened the old workings, but since they had only a few thousands of dollars and their work was based on the hope that the mine would pay for its own development, they soon had to shut-down. Much of their work was also ill-advised and much of their available money was wasted in an unsuccessful attempt to mill the ore in a home-

made arrastra. However, the work done by these two did develop a little ore, some of which is of a fair grade, but the values and vein width are quite irregular.

The Bureau of Mines has done considerable development by tunnels on the opposite side of the hill from the old workings. Many small stringers were encountered, and generally the values were quite good. There is enough concentration of values in certain sections to make the exploitation possible if there was a local market for the ore, but no profit could be made shipping to the States on account of the high freights. Although the veins are rather narrow and somewhat irregular, the values are generally high and the development possibilities still attractive because with what work has been done the surface has been scarcely scratched. It is believed that this property could be obtained on a lease, or possibly it could be purchased. It is owned by Mr. Sayre's son who is now living in Corozal.

In the Carmen township of Guayama, in the south-eastern part of the Island, considerable work has been done on the quartzose veins carrying small percentages of copper and lead minerals. The first work was done about 1886 with British, American and local capital. Considerable tunneling was done and a shaft was sunk for about 100 feet. According to the best information available, between 300 and 500 tons of ore were shipped to the United States. No figures are available as to value of the ore, either per ton or gross, but as the mine was very isolated at that time with relation to existing roads, the ore had to be transported, first on horseback, and then by wagons to the port, the mine cost money and was closed down. The capitalization, according to what little can be learned, was quite small. The mine workings are now only a few hundreds of feet from a paved government road just recently finished.

Once, since that time, an effort was made to re-open the mine and some fifty tons of ore shipped, but as the shipping conditions had improved but little over those of 1886, and the available capital was small, the attempt ended in failure. Recently the writer took a number of samples from the tunnels and found the values were widespread but rather low. The old stopes are inaccessible due to falls as well as the last 100 feet or more of the tunnel with the best values

The ore is certainly not of a character to stand shipment under present conditions of freights to the States. But the ore contains sufficient lead and copper values, as well as gold and silver, to make a good shipping concentrate. Water is available for milling and there is a good labor supply at hand, though untrained in mining work We consider this prospect worthy of more developement.

At San German, in the south west, is a small mine located on a serpentine shear zone. As is usual in such occurrences, the ore is irregular in widths and values, but much of it is extremely high-grade. Considerable work has been done, some ore has been blocked out and there is a small amount of it on the dumps. Undoubtedly some of the ore could be sorted and shipped at a profit, but it would be better to concentrate the ore to save the excessive freight to the States. The ore is not amenable to cyanidation on account of the high copper values—often as high as 5 per cent and from 25 to 30 per cent on selected samples. A shaft sunk by the Bureau of Mines during the past year shows that the values continue down below present working level. Work on this shaft was stopped by an inflow of water—mostly seepage from old workings—which we could not economically handle by hand bailing and no pump was available.

If any of the four mine prospects described were in the western part of the United States, they would have been under development long ago, and especially is this true of Corozal and San German where such highgrade values are obtained. Yet here in Porto Rico there is an apathy of Porto Rican capital towards mines which would be unbelievable in other mining regions.

COLLECTING IN NORTHERN VERMONT

By LEON B. BAILEY

It was about 25 years ago that F. J. Tupper and I decided one early spring day to spend as much time as we could among the spruce, balsam and hemlock trees which dotted the hillsides of our homes in northern Vermont. We wanted to be out in the open air for our health.

From boyhood days I had always been interested in minerals and so, as we hiked along, I would stop to look over the rocks. One day Mr. Tupper began to complain over my frequent stoppings—saying he couldn't see anything interesting in old rocks. I made no reply but kept on with my search—soon a pocket in a ledge containing quartz crystals was found. On seeing the crystals and noticing their sparkle in the bright sunlight, he became highly excited and wanted to know what they were and better still wanted to get them out. We had no hammer with us so postponed their extraction for another day.

In the meantime we obtained hammers, chisels and collecting bags and then returned to the ledge out of which the crystals were easily removed. They proved to be clear, of good quality and pleased Mr. Tupper so much that he became instantly interested in minerals—in fact we then and there decided to make the collecting of minerals our hobby.

With this good start, we began to examine the rocks carefully and over a wider area than ever before. Mr. Tupper's knowledge of chemistry was very helpful as he was able to make tests on unknown minerals.

Soon we drew up a plan covering the town of Fairfield in south central Franklin County (our home town) for the purpose of surveying it for minerals. We started on the east side of the town going on a line a little east of south, across the town to a little west of north, then we set off about ½ mile and came back. This was repeated until the town was covered.

Line 1 produced clear quartz crystals (rock crystals).

Line 2 produced milky quartz crystals and a little hematite.

Line 3 produced massive quartz and microcline.

Line 4 produced a few quartz crystals.

Line 5 produced milky quartz crystals.

Line 6 produced clay and ocher.

Line 7 produced limestone.

In our traverses across the town, we found outcroppings of quartz which contained the crystals of which some were clear and others cloudy. The largest outcropping is 3 miles east of the town (1 mile west of East Fairfield) on the road to St. Albans. Leaving East Fairfield, going towards St. Albans, one crosses a concrete bridge; the first farmhouse on the right, high up on the hill, has an outcrop of quartz in front of it. This outcrop carries clear and cloudy quartz crystals. The other minerals were found in a gray, schistose rock.

Bakersfield, Vt.

We then went over a part of Bakersfield, about 7 miles east of Fairfield (3 miles east of East Fairfield) and in the same county. Here we found calcite, garnets, hematite, pyrite, quartz (clear and milky crystals), titanite and stalactites (some being soft like a sponge which we had to cut off the rock and on to cotton batten and left to dry and harden—these were of different colors, white, black, yellow, and purple).

The quartz crystals were in loose boulders having seams of quartz running through them. The other minerals were found in the gray schistose rock mentioned before. All these minerals occur on Checkerberry Ledge and on Peaked Hill.

Belvidere, Vt.

Our next field of operation was around Belvidere, in the adjoining County of Lamoille, on the southeast. To reach the locality, go from Bakersfield to Jeffersonville, to Waterville, to Belvidere Junction, to Belvidere Center. At Belvidere Junction inquire at the small country store where the old talc mine is located and you will be told how to reach

it. This mine played out a long time ago but the finest and most beautiful actinolite I ever saw can still be found here—large slabs of it have been cut out. Talc, calcite and massive garnet also occur here in a brook 4 miles up the valley.

On the road from the Junction to Belvidere Center, a brook comes down the mountain on the right. Up the brook a short distance is a large outcropping of quartz; on the right side of the brook at this outcrop a bed of clay is exposed in which we found some very fine rock crystals. This clay has been dug out to the bed rock so that now it is difficult to find any more crystals. Milky quartz crystals also occurred here.

Eden, Vt.

This locality is in the northeastern part of Lamoille County. From Belvidere Center to Eden, beautiful scenery is very prominent. Asbestos mines are in the neighborhood before Eden is reached and a road sign will direct you to them where chrysotile asbestos, serpentine, and talc may be obtained.

In 1892, I was one day on top of Belvidere Mountain and on the way down picked out some soft fibers from the ledges but gave the matter no thought. A year later a man from Fall River, Mass., did the same thing but when he got home and happened to show his specimens to a mineral company he was given $5,000 to show them where the fibers were collected. The Falls River Asbestos Company was organized to work the deposit which has since been shown to be a continuation of the huge deposit at Thetford, Quebec, Canada.

A 23-mile power line was built from Fairfax, Vt., to the mines, which are situated on the south and east sides of Belvidere Mountain.

The fiber is so short that it was feared at first that it would not pay to work the deposit; after several companies have tried the present company has made a go of it.

The rock is quarried from the side of the mountain and hauled by trucks to the crusher building just outside of the quarry where it is run through several crushers then through the drier to the shakers where the fiber is sucked from off the screens and conveyed to the bins —the waste going to the dump which has become a small hill. The finished material is hauled by trucks to Hyde Park, 12 miles away, and shipped over the St. Johnsbury and Lake Champlain R. R.

Nearly the whole of Belvidere Mountain is now owned by the Vermont Asbestos Co., the present operators of the deposit.. This summer the company has opened up a deposit on the north side of the mountain. This will be known as plant No. 2.

Johnson, Vt.

On leaving the asbestos mines and coming down to Eden, you make a right turn and go down the valley 4 miles to North Hyde Park where you take the Johnson road for 2 miles to a four-corners, keep to the right and go about a mile where you again take the road to the right which will lead you to another old talc mine in East Johnson. An old mine shaft is here. This shaft went down for five levels and some of its tunnels extended nearly ½ mile—but it is all caved in now. There is another and newer shaft further up the hill which is in operation by the Eastern Magnesia Talc Co., Inc., Johnson, Vt. Here nice specimens of dolomite, pyrite and talc may be collected. Titanite occurs in dark brown crystals in a dark schistose rock found on the hill sides.

A circular of the Eastern Magnesia Talc Co., Inc., describes the geology and mineralogy of its mine as follows:

Geology: "Igneous intrusions of ultra basic peridotite are found in a country rock of sericite schist. The peridotite has been serpentinized and altered to serpentine which alteration is practically complete. This has been followed by steatization.

The ore body consists of lenses striking northeast and dipping west 75°. A typical lens consists of vein talc next to a sharply defined wall of black altered schist. The vein talc is gradational towards the center of the lens to a grit zone consisting of talc and magnesite. The core of the lens is frequently ser-

pentine of verd antique quality with small stringers of talc and magnesite.

The gangue material in the talc deposit is magnesite which is a marketable product from the milling plant. A series of these lenses varying in width up to 200 feet occur in a zone at least one half mile long. These lenses are in echelon with their bottom as yet not determined.

Mineralogy: Chief minerals are talc, and magnesite occurring in the form of breunnerite. The accessory minerals are pyrrhotite, gersdorffite, and pyrite. The nickel content of the ore is 0.1%. Cobalt occurs in the form of cobaltite and smaltite, and is recovered along with nickel in table concentrates."

The mine is an underground workings opened up by a 45° incline shaft 250 feet deep. The talc is hauled 4 miles by trucks to the mill at Johnson on the St. Johnsbury and Lake Champlain R. R.

My boyhood days were spent about one mile from where these mines are now. The farmers in those days, 1882 to 1890, used to cut out a rock which they called "freestone" to lay up the arches in their maple sugar places; in 1902 they learned that this freestone was talc.

North Wolcott, Vt.

On the way from Morrisville to Wolcott, you make a left turn about a mile from Wolcott and continue up to North Wolcott where you turn to the left just before the village is reached—about 2 miles up the road and in the hills is a farm house. One day the farmer, in plowing up his field, dug up a nice quartz crystal which he gave to me when I visited him. None have been found since although I have examined the terrain carefully, even the ledges and boulders.

This is a 2 x 4 inch loose smoky quartz crystal whose terminal faces contain inclusions of many tiny reddish flakes of hematite. It is interesting to note that the inclusions occur practically in the terminal faces only (close to the surface of the crystal)—and a very few in the prism faces but close to the terminal faces. The inclusions assume a triangular form in general but other shapes also appear and they are of various sizes from tiny to minute. One of the prism faces contains a large number of minute pits which might possibly have hematite in them—nothing appears to be in the pits from an examination through a magnifying glass.

Magnetite[1] has been found at Wolcott but I have never ran across it.

Troy, Vt.

Last fall I was on my way up through Troy, Vt., to Newport, Vt., when I noticed a large white rock besides the road so stopped to look it over. One side had large quartz crystals on it. On getting home I wrote Mr. Tupper about the find and urged him to come over and see it. When he arrived we went to the locality and went to work on the rock. When we finished we had a slab about 18 inches square and 6 inches thick whose top side was covered with quartz crystals about 3 inches long.

The following minerals have been reported as occurring around Troy:

Chromite: Has been worked to some extent[2].

Ilmenite: Found in the rocks.[3]

Magnetite: Found in South Troy[4].

Emerald Nickel: Reported in South Troy[5].

Serpentine (chrysotile asbestos): Found in Troy[6].

Siderite: Found in South Troy[7].

Zaratite: Reported only from South Troy[8].

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[1] 17th Report of the State Geologist (1929-30) p.160

[2] 12th Report of the State Geologist (1919-20), p.301

[3] 17th Report of the State Geologist (1929-30), p.160

[4] 17th Report of the State Geologist (1929-30 p.161

[5] 17th Report of the State Geologist (1929-30), p.161

[6] 7th Report of the State Geologist (1909-10), p. 39

[7] 8th Report of the State Geologist (1909-10), p. 35

[8] 17th Report of the State Geologist (1929-30), p.178

TIN DEPOSITS OF NORTHERN LANDER COUNTY, NEVADA

As a part of the investigation of domestic deposits of strategic minerals by the Geological Survey, United States Department of the Interior, one of the Survey's geologists, Carl Fries, Jr., assisted by Arthur P. Butler, Jr., has examined a tin deposit 22 miles north of Battle Mountain, Nevada, a town on the Southern Pacific Railroad and on the main highway between Salt Lake City and Reno. There is no record of any production of tin from the area.

The tin-bearing veinlets are exposed in five prospect pits in an area about 3½ miles long and half a mile wide at the north end of the Sheep Creek Range. The exposed veinlets, more aptly called incrustations, occur in thick flows of rhyolitic lava and are composed of cassiterite (tin oxide) and specularite (iron oxide). They have a maximum length of 20 feet and a thickness of one-sixteenth inch to 6 inches averaging about a quarter of an inch. Parallel and reticulating veinlets form lodes 4 to 6 feet thick and 15 to 20 feet long. Virtually no cassiterite is disseminated in the surrounding rock. The tin appears to have been derived from the lavas and deposited by fumarolic action.

By narrow stoping and hand sorting possibly a few tons of metallic tin could be produced from the exposed veinlets. It is certain that no large body of rock has an average tin content of as much as one-hundredth of 1 percent of tin, judged by microscopic study of rough channel samples across the ore bodies and by quantitative spectrographic assays for tin in a few selected samples. Only part of this percentage would be recoverable, as only part of it could be concentrated by ordinary methods; some of it is in the specularite either as a part of the mineral or as submicroscopic grains of cassiterite, and loss of tin is always high in smelting concentrates containing a high percentage of iron.

Placer deposits of commercial grade are limited to small draws that head in the area where the veinlets are exposed. As the gravels are only a few inches thick and of small volume, only a few tons of cassiterite could be recovered from them. The large area of alluvium in the valley bottom below the tin-bearing veinlets has not been thoroughly sampled, but a few tests indicate that its tin content to a depth of 40 feet is less than 0.1 of a pound a cubic yard.

DR. ROY RETURNS FROM EXPEDITION TO FOSSIL DEPOSITS OF NEW YORK

Dr. Sharat K. Roy, curator of geology at Field Museum of Natural History, Chicago, Ill., returned to the museum October 10, 1941, from an expedition to fossil deposits which have been waiting for a museum collector some 400,000,000 years in western and northern regions of New York state. Dr. Roy brought to the museum various groups of invertebrate fossils, chiefly from the upper and middle Devonian periods.

Dr. Roy will devote much of the winter to research in connection with these specimens. The best preserved ones will be added to the museum's exhibits of prehistoric life, and the balance will be added to the study collections of the department of geology. In the exhibits the specimens will be arranged in two series, one chronologically to represent the age relations of the various groups, and the other to show the biologic relationships. This manner of installation will increase the usefulness of the collection to serious students of paleontology, as well as vivifying the whole picture for the casual visitor to the museum.

CALIFORNIA FIELD TRIP

By LLOYD M. DEMRICK

The street lights in San Francisco snapped off before full daylight as we started the car, casting a ghostly dead-city-on-the-moon spell over the avenues. Gliding over the Bay Bridge we could see blobs of lights around the Bay Area shipyards; a black batttleship at anchor below blinked naval gibberish to some unknown receptor. Then the other side of the bridge was reached and we went past the maze of trolley wires in the interurban storage yards. Beyond over the East Bay cities a pall of smoke glowered ominously—but we knew it for the bluff it was.

Thru Stockton, then a few minutes stop at the old town of San Andres and, tourist like, a visit was made to the Chamber of Commerce where we mused over their collections of minerals, old guns, etc.

A little north again to Jackson, another of the old Mother Lode, narrow streeted, towns of the days of '49. Here the road turned east climbing the long winding grade up to Carson Pass. Silver Lake, about 8000 foot altitude, abruptly broke into view before us. A little further on thru the aspen and pines came Twin Lakes. Here we stopped for lunch.

Across the lake to the southwest the mountains rose higher and higher; irregular patches of snow sprawled over their purplish bleakness, and we, with partly closed eyes, leisurely studied the grandure of the horizon—a lost horizon so it seemed and we conjured up visions of Shangra La and felt its remoteness.

Around us everywhere blossomed lupin, columbine, sweet scented wild roses, a white mariposa lily and other wild flowers. Tiny insects of many kinds busied themselves on the plants. Butterflies flitted. A drifting shadow, offspring of a lonely cloud, wandered across the lake.

Ah, me, but we were rock hounds and our mineral sensitized noses vexed us on.

We had noticed the highway markers at the even thousand foot elevations as we came up the long easy grades; three thousand feet, four, five, six, we missed the seven, then eight and now we approached the highest on the Carson Pass, 8600 feet.

The Wolframite Mine

Then we glided down a little valley till a small sign caught someone's eye, or, maybe I should say nose. It read "Wolframite Mine" and an obliging arrow pointed toward the abrupt hills. Since we were ahead of our planned schedule we turned up this heaving, panting road, our noses twitching and little wolframite crystals dancing before our eyes.

The road (?) climbed fearfully and then, as despair was almost upon us, we crossed a singing creek and there ahead a tumbling waterfall chorused a welcome to us. Midst a clump of tall pines nestled several lumber and tin shacks. The one with the triangular dinner bell we approached and, as it developed, was as near as we could get to the mine.

It was in litigation, so we had to stop there. The mine itself was higher up on the mountain side.

The cook took us under his wing tho and showed us some sort of a table cover he had made in his spare time. The thing consisted of a bunch of colorful square holes with knots of wool at the corners of the squares.

There were many ore specimens in the mine office, he went on to tell us, but he dared not even let us in to see them.

He also had some pictures of the cookshack taken last winter. We said he must have given us the wrong pictures but he was sure of his ground, or rather snow, for he said the shack was right there under that snow bank. He had been snowed in for 120 days last winter he had us know.

We shuddered at that but now in the latter part of July—tumbling water, lofty singing trees, sassy chipmunks and the invigorating altitude momentarily

desensitized our noses; we just had to stop, look and listen a bit.

Markleeville

On the highway again we coasted down little valleys to our rendezvous at the tiny hamlet of Markleeville. (Markleeville is in the eastern part of Alpine County about 5 miles from the Nevada line.) The hotel looked like a page out of the old west and, as it developed, was. Built in the sixties on Silver Creek, a few miles away, it had been dismantled in '85, moved and rebuilt on its present location.

Several other cars of rock hounds were already there. Yarns began to spin and speculation on the probable findings of the morrow ran high. It was now suppertime (dinner is at noon hereabouts) so we took care of that chore and soon rolled in. Between the hotel and the tourist court, and the fact that fewer fishermen than usual were there, we got bedded down quite well.

The Leviathan Mine

In the morning a couple more cars showed up and at nine we headed for the Leviathan mine some seven or eight miles higher up in the mountains.

This is one of those Amen-Brother-Ben-shot-a-goose mines that turned out to be a hen. A copper mine in the sixties, the ore was wagoned to the coast and sailed around the horn to England for smelting. Then the miners started drifting lower down the canyon to undercut the copper ledge and ran into sulphur and water, neither of which they wanted, so they gave up in disgust.

From then on till 1930 or so the mine had miscellaneous owners. Then the sulphur people took it over and have put in quite a bit of money in development work. All of the minerals collected came from the walls of these tunnels dug since 1932. The mine is not producing at present, just being kept in an 'open' shape.

Sam Kernan, a bulging giant, seemed to be in charge and took us under tow. All around in the steep walled canyon were remnants of the past, tumble down shacks, weathered dumps, tailings dams and other interesting things to poke around in had we the time.

We had brought a few electric lanterns but Sam dug up a handful of carbide lites so we were well lit when we started in the mine. At first it was thought the women would not be allowed in the mine but they were permitted to go since the party was small.

About 300 feet back in the tunnel we started hitting pay dirt; Halotrichite matted the walls shining at us in silvery splendor, some resembling silken asbestos, some curled and twined like platinum-colored wire silver from fairy-land. Some other material resembling fungus growths on rotted wood caught our eyes. Several of the Elders reckoned this was a variety of the Halotrichite.

Then came a few stalactites of Chalcanthite which, in our dancing lites, evoked many "Ahs" and "Ohs" and cries of, "I saw it first."

In following a side drift in to one big stope, a cluster of coldly listening Chalcanthite spines stabbed down from the roof. One of them was a full two feet in length. Around in this part of the diggins Romerite covered parts of the walls, sometimes being all mixed up with layers of Chalcanthite.

Melanterite is known to exist in the mine but only one stalagmite had much of a greenish color. It may have been a kind of a Melanterite-Chalcanthite cross breed.

Some pieces of what our guide called Black Sulphur were chipped off the walls. Here and there a veinlet of pure sulphur cut a yellow streak through the tunnels.

In one place the walls were clothed with something that resembled antlers, little horny appearing things from a half inch to two inches long. The Elders woudn't even guess on this one.

Parts of the tunnels were timbered; in one place the ground was so "heavy" it pushed the track up toward the roof some six or eight inches.

Several hours were spent in the numerous tunnels and when we came out for good our containers were full to overflowing. These sulphur minerals, except

(*Continued on page 415*)

A NEW TOURMALINE LOCALITY IN NEW YORK

By PETER ZODAC, Editor
Rocks and Minerals

During the past summer it was the writer's good fortune to visit a large number of mineral localities. One of the most interesting was a newly opened up pegmatite quarry in northwestern Saratoga County, New York, when in company with Drs. L. Prescott Brown and A. C. Worth, of Albany, N. Y., and Mr. O. W. Bodelsen, of Mt. Kisco, N. Y., many good lustrous black tourmaline crystals were collected. The trip was made on July 27th.

Location

The quarry is 12.5 miles north of the Batchellerville bridge over the Sacandaga Reservoir on the South Shore Road. The South Shore Road parallels the reservoir on the east and south, The quarry is 75 feet to the left (west) of the road. Saratoga County is in the east center of New York.

Hunting tourmaline crystals in the quarry.
Mr. Bodelsen (upper) and Dr. Brown (lower) uncover some fine specimens. (View looking north)
Dr. Worth photo.

The quarry is in the tiny hamlet of Overlook, 0.3 mile north of its post office which is also on the South Shore Road.

Layout

The quarry is a vertical pit 100 feet long, 30 feet wide and about 20 feet deep whose trend is approximately north and south. The top of the pit is approximately level with the road. A small shanty, between the northeast corner of the pit and the road, is the only building that was present. A small dump extended from the shanty north while a larger one was near the southern end of the pit. The Atlas Feldspar Co., which operates the Batchellerville pegmatite quarries, is believed to be the operator of the pit.

Mineralogy

Tourmaline is the most interesting mineral to occur here. Other minerals present are:

Albite: Grayish-white striated masses associated with smoky quartz.

Biotite: Is very common and was found on the dumps as loose, lustrous black, four and six-sided plates and crystals, some reaching 3 x 5 inches in size. A few small lath-shaped crystals were also noted.

Limonite: Noted as brown stains on rocks but not in enough amounts to ruin specimens.

Microcline: Grayish masses, often forming graphic granite with smoky quartz; flesh-colored masses also seen.

Muscovite: Rare, as only tiny flakes in pegmatite were noted. Pearly white sericite also seen.

Quartz (Rose): Common as loose masses on the dump. Apparently it is saved in quarrying as one huge container was full of the material. It varies from pale to deep pink. One deep pink gem quality specimen was found by us.

Quartz (Smoky): Pale to deep smoky masses are common.

Tourmaline: This is very common and occurs in lustrous black striated crystals

varying from tiny up to huge ones. We never saw so much good black tourmaline crystals before as were seen here. There were slender terminated lustrous vertically striated crystals, ¾ x 1½ inches in size to chunky crystals 2 x 2 inches in size and huge crystals that must have been originally 18 to 24 inches or even longer as sections almost 12 inches in diameter were collected. An interesting crystal showing good partings was also found. It was 1¼ inches in diameter and only ½ inch in length. Another interesting specimen was 1½ inches in diameter and 2½ inches in length, which showed the tourmaline as a thin shell around a mass of grayish microcline. Unfortunately the crystal was incomplete (broken) as the tourmaline only half encircled the microcline. The most interesting of all was a doubly terminated loose crystal, 1½ inches long and the same in diameter. The best crystals of the smaller size were found by the writer on the little dump north of the shanty; the best of the huge crystals, most of which were not terminated, were dug out of the pit by the other three collectors.

Acknowledgments

The grateful thanks of the writer are extended to Drs. Brown and Worth for it was they who first knew of the locality and guided us to it. Thanks are also due to Mr. Bodelsen who was my congenial companion on the trip.

A NICKEL DEPOSIT NEAR GOLD HILL, BOULDER COUNTY, COLORADO

In the present investigations of strategic minerals by the Geological Survey, United States Department of the Interior, the nickel deposit of the Copper King mine, near Gold Hill, Boulder County, Colorado, was examined by two Survey geologists, E. N. Goddard and T. S. Lovering. This deposit is about three-quarters of a mile southwest of Gold Hill and 32 miles northwest of Denver.

Mine workings at the Copper King mine consist of two adits and a connecting winze, an open cut, and a shaft. Sixteen diamond-drill holes, having a total length of 2,500 feet, have been drilled from the bottom level.

The ore body is in a layered amphibolite lens in biotite schist of the Idaho Springs formation and is cut by several intrusive bodies, one of which is a gabbro dike which may cut it off.

The nickel ore occurs in the coarser-grained layers of the amphibolite, which are commonly 5 to 15 feet thick. The localization of the ore minerals seems to depend on the composition of the layers, their texture, and the presence of microscopic shearing and fracturing. Polydymite, a nickel sulfide, is the most abundant primary ore mineral; the iron-nickel sulfides, bravoite, violarite, and pentlandite, and other nickeliferous minerals which are present appear to have been formed by the alteration of previously existing minerals.

The ore minerals are in part disseminated irregularly through the host rock, but in places they form a network replacing various silicate minerals. The nickeliferous sulfides have been oxidized to garnierite, a nickel silicate, as much as 15 or 20 feet below the surface, and partial oxidation extends about 30 feet farther.

The grade of the ore varies widely even in individual layers, ranging from 1.3 to 13.0 percent of nickel in the oxidized part of the deposit and from 0.48 to 6.0 percent in the part below the zone of oxidation. Reserves of about 25,000 tons of rock containing 2 to 3 percent of nickel have been blocked out by drifting. Further drifting and diamond drilling from the bottom level revealed about 30,000 additional tons that may average about one-half of 1 percent of nickel, and this material might, by selective mining, be made to yield 15,000 tons containing 1 percent of nickel. There is no way of predicting what lies on the other side of the gabbro dike mentioned above; further drilling or the extension of mine workings beyond this body might reveal additional ore.

Bibliographical Notes

Fortunes in Minerals

(Simple tests and how to make them): By Ion L. Idriess, with a foreward by A. N. Graham.

This publication is really a handbook for the prospector as it tells in very simple language how minerals occur and how they may be recognized. To the reviewer's mind the first half is the most interesting as the author cites typical examples how valuable minerals may occur in nature: how their occurrence differ from those of little value; and how they may be recognized. In many cases the author cites actual instances how valuable ore deposits have been found in Australia.

Three suggestions of the author for prospectors are worth repeating. 1—Use your head and eyes. 2.—Obtain a collection of correctly labelled minerals, examine them carefully and then mix them thoroughly (two, three, four, or more of them) with sand and gravel so that they may approach actual conditions in the field—then try to pick out each mineral and identify it. 3—When out in the field, prospecting, look for "variety" in the outcrops. Any outcrop which differs from the others in any area is apt to contain interesting minerals which might turn out to be valuable ores.

The only drawback to this very interesting book is the lack of illustrations as not even one appears. Nevertheless, the book is well written, full of valuable information and is recommended to all those who are or plan to be prospectors even if only in an amateur sort of way.

The book contains 128 pages, sells for $2.50, and is published by Angus and Robertson, Ltd., 89 Castlereagh St., Sydney, Australia.

News Bulletin of the Mineralogical Society of Utah

This is the official publication of the society of which Junius J. Hayes is the President. Vol. 2, N. 1, Aug. 1941, consists of 15 pages full of interesting items relative to the club, its members and their activities. We understand that the bulletin is issued twice a year. The headquarters of the society is in Salt Lake City.

Report of the Bureau of Mines on the Mineral Resources of Porto Rico for the fiscal years 1939-1941.

This interesting report of 52 pages covers gold, manganese, iron, copper, lead zinc, pyrite, gypsum, barite, glass sands, marble, cement rock, clay products, and fuels.

Issued by the Bureau of Mines, San Juan, Porto Rico.

Gold Nuggets of the World: By John Gaarden.

We have books devoted entirely to quartz, to the diamond, to tourmaline, and now we have one on gold nuggets. This new book is unique in some ways and yet it is a most fascinating one as well. It describes all the famous nuggets of the world, tells their weights and values, and where found. In many cases the nuggets are actually illustrated in color.

We learn for example that the world's largest nugget is not the "Welcome Stranger" of Australia (2166 ozs., value (1940) $71,478) but the "Carson Hill Nugget" that was uncovered in a huge quartz vein on the Morgan Claim at Carson Hill, in Calaveras County, California, on Nov. 22, 1854. The nugget was 54 inches long, 5½ inches thick, weighed 2340 ozs. and its 1940 value is $77,220.

This fascinating book, which should be in the library of every mineral collector, contains 149 pages, 31 illustrations (18 in color), and sells for $1 a copy. Published by the Gaarden Publishing Co., Hollywood, Calif.

Field Fables of "Rocky" Moore

I am sik an' tired uv yew fokes accusin' me uv eetin Krow Meet! It is troo that I am a-raisin' Krows over in the Beeler Butes—but fer a far difrunt reeson. Not that there meet aint about as sweet as enything yew ever et, but fer yore informashun—Krows likes purty shiny, sparklin' things jist like Rok Houns does an' they picks thim up an hauls thim to their nests. I got one thet is speshelizin' in Diamonds and Rubys—anuther thet brings in nuthin but gold nuggits—his nest assayed $25,000 to the tun last munth an' this luks like a bigger munth! Efn sum uv yew skeptiks want the proof, jist drop by the Beeler Butes and I'll huv une uv thim Krows drop a purty gem or gold nuggit right in yore lap.

Yore's Trooly, "Rocky" Moore, Authur.

Collectors' Tales

PERILS OF AN INEXPERIENCED CAVE EXPLORER

While exploring a partly developed cave in western Virginia, we had cautioned the men to always proceed head first in crawling, using a flashlight to examine the passageways for loose rocks on walls and ceilings, etc. We also warned to watch out especially for unexpected deep holes and thin flowstone ledges. We thought that we had fully impressed the men so that they would use caution in proceeding through the many rooms and passageways.

We became separated and some in their exuberance in finding such beauty in the cave formations and so many leads to other rooms, became careless in their exploring. One of the more venturesome fellows pushed himself through a lead, feet first, and called out that he had found a place where his feet could not touch bottom. We told him to remain in steady position and find something to hold on to until we could get a rope to him and pull him out to safety. Another, of the more experienced explorers, then crawled through the lead, using his flashlight before him. In a few minutes he called to us to pull him out at once. When he could get his breath and felt more at ease among his friends and on solid footing, he said he saw a big deep place. We decided that we would return the next day with more equipment and explore this "Hell hole" as he called it.

Needless to say, the "feet first" "fellow kept close to the main party of explorers after his experience. We proceeded to explore further and in our meanderings we descended to a lower level in the cave coming into a very large room. In one side of this room was a large, deep pit, and about 65 feet above it was a very thin ledge of flow stone. About three feet back of the edge of this ledge was a small stalagmite. We had an idea that this must be the place that our careless explorer was trying to find a place to put his feet while dangling there, holding on to the small stalagmite. I felt someone clutching my arm and then falling by my side. The explorer's knees had given away when he realized the danger he had been in.

—Walter Amos

California Field Trip

(*Continued from page 411*)

the pure sulphur, are all very *wet* minerals (just look up the formula for Halotrichite) and will not keep in the outside air: they must be sealed in jars.

Return Journey

We traveled back through Ebbetts pass, this one climbing to 8800 feet. More snow freckled mountains. This area is in Alpine County, California, and is well named.

Past Alpine lake we coasted-down-down-down, but all gentle grades. At Angels Camp the country started to show signs of leveling off.

I have spoken mostly of the mountains, the flowers and bugs and things. The trip was not supposed to produce anything worth cutting into a gemstone, which is what minerals were made for (?), so I was just a tourist. Maybe next time we will be after Demantoids or maybe Benitoites and then you shall not be made to suffer with landscapes and the organic world.

Club and Society Notes

New York Mineralogical Club

The club's 56th year was opend on Wed., Oct. 15, 1941, at 8:00 P.M. at its headquarters at the American Museum of Natural History, New York City. Mr. John N. Trainer was the presiding officer assisted by M. Allen Northup, Secretary.

The death of three members, recently deceased, was announced with much sorrow. They were Dr. Olaf Andersen, Dr. Horace A. Woodward, and James F. Morton.

The program was devoted to summer activities of the members. Leonard Morgan was the first speaker who described an interesting trip to many localities in New Jersey, Pennsylvania, New Hampshire and Maine which he had visited. A number of fine specimens from the localities visited were on display.

M. Allen Northup described his visit to the Spruce Pine region of North Carolina and he, too, had many fine specimens from the area on display.

O. Ivan Lee described his visit to Canada and to some localities in Virginia.

Mr. John Rosch, the only living member of the original eight founders of the club, spoke briefly on the club's first meeting and announced that he had prepared a paper on it for *Rocks and Minerals*.

A special meeting will be held on Wed. Nov. 5th, whose chief attraction will be a talk by Mr. E. A. Maynard on his recent western trip. It will be illustrated by colored slides. Refreshments will be served.

Bridgeport Mineral Club

The 6th field trip of the year was held on Sunday, Oct. 19th, at the pegmatite quarries of Bedford, N. Y. The activities were centered on the Baylis quarry where some very fine specimens of bismuthinite, were found and collected. Other minerals obtained by the group were beryl, columbite, cyrtolite, peristerite, and rose quartz.

Queens Mineral Society

The second fall meeting of the club was held at the home of Mr. and Mrs. Richard Green, 40-43 Forley St., Elmhurst, N. Y., on Thurs. Oct. 9th, 1941. The speaker of the evening was Mr. A. Green who gave a very interesting talk on the occurrences of the minerals of the cobalt area of Ontario, Canada. The talk was accompanied by pictures and some excellent specimens of the area.

It was decided at this meeting to visit the Portland and Haddam areas in Connecticut on Sun. Nov. 9th. This will be the first field trip of the fall season for the club.

Southern Arizona Mineral Society

A new club in the Southwest, the Southern Arizona Mineral Society, was organized on Thursday, Oct. 2, 1941, in Tucson, Ariz., at which eleven original members paid their dues for the coming year. The following officers were elected:

A. Earl Dunn, President
Mrs. Barbara Payne Robinson, Vice-President
Stanley R. Blake, Secretary-Treasurer

According to its constitution one regular meeting will be held on the third Tuesday of each month. The first took place in the Chamber of Commerce rooms on Oct. 21st at which Dean G. M. Butler, of the University of Arizona, was the guest speaker.

Mid-West Federation of Geological Societies

The Wisconsin Geological Society was host to the Mid-West Federation of Geological Societies October 18-19. A program of expansion was discussed and the importance of field trips, local exhibits, and speakers of prominence were stressed. A connection with the Arts and Crafts was suggested as a manner of getting the public acquainted with rocks and minerals. The exhibits brought by the various delegates were expectionally brilliant and attracted much atteniton. After a banquet, Prof. Frank L. Fleener gave a lecture on the Fundamentals of Geology, and Mr. Archie Nesbit explained the Technique of Polishing and Cutting. The entertainment was concluded with colored movies of geological field trips. The following officers were

elected for the ensuing year:

Mr. George Huss, Chicago, Ill., President.
Mr. Frank L. Fleener, Joliet, Ill., Vice-President.
Captain Roy S. McIntosh, Chicago, Treasurer,
Mr. Frank H. Nelson, Secretary, 740 N. Plankinton Ave., Milwaukee, Wis.

New Jersey Mineralogical Society

The New Jersey Mineralogical Society will hold its first public exhibition for one week starting November 15th, in the large and spacious Art Room, at the Plainfield Public Library, Plainfield, N. J.

Members will exhibit prize and unusual specimens from their collections. Many outstanding collectors and museums will contribute unusual specimens for display. Various unique and unusual phases of mineralogy will be demonstrated.

The exhibit will be open daily from 3 to 10 p.m., and all day long on Saturdays, Sundays and holidays. Members of all Eastern mineralogical societies are invited to visit same.

With Our Dealers

We welcome the first appearance of a new dealer among our advertisers, Richard M. Pearl, 1539 Broadway, Denver, Colo. Mr. Pearl is Secretary of the Colorado Mineral Society and a member for many years of the Rocks and Minerals Association. In his advertisement, Mr. Pearl features gold nuggets and wire silver. The wire silver comes from Aspen, Colo., where in 1894, the largest silver nugget ever found was taken out of the Smuggler mine. At that time Aspen was the richest silver camp in the world; now more skiers than miners enter this isolated town high up in the Colorado Rockies.

John Albanese, P. O. Box 281, Newark, N. J., states that he has acquired so much additional material—many new to his stock—that he may be forced to issue a new price list.

H. Sussbach & Co., 15 Maiden Lane, New York City, announce the receipt of a new shipment of the finest Uruguay amethyst suitable for cutting. Amateur cutters, here is an opportunity to acquire some fine gem material for your stock.

John A. Grenzig, 299 Adams St., Brooklyn, N. Y., is featuring many books in this issue of which he has a large stock. Better look his ad up and order 2 or 3 books from the list.

Ward's Natural Science Est., Inc., 298 Goodman St., N. Rochester, N. Y., is featuring some interesting New England minerals in this issue. Look them up before it slips your mind.

A. J. Alessi, 430 S. Highland Ave., Lombard. Ill., returned recently from a trip to the fluorite region of southern Illinois and some lead mines of Missouri. We are sure he brought back many fine specimens to add to his large stock.

H. E. Mitchell, proprietor of the Pacific Mineral Mart, 637 Redondo Ave., Long Beach, Calif., is forced to close up his store on or before Jan. 1, 1942, owing to ill health. He is offering many specimens at greatly reduced prices to clean out his stock. Here is an opportunity for collectors to acquire fine specimens at bargain prices.

In this issue, Schortmann's Minerals, 6-10 McKinley Ave., Easthampton, Mass., are featuring a rare mineral, diaboleite, an oxychloride of copper and lead. Because of its rarity and bright blue color it should prove a welcome addition to any collection.

The Schortmanns are also planning for their annual mineral exhibition and sale which is to be held on Dec. 11, 12 and 13 at the Hotel Shelton, New York City.

The Tenth Anniversary Catalog featuring minerals, gems, books, supplies and lapidary equipment, has just been released by Warner & Grieger, 405 Ninita Parkway, Pasadena, Calif.

This is a most attractive catalog, consisting of 44 pages with over 60 pictures which completely illustrate all items offered. Whether you collect minerals, crystals or gems—or speciallize in fluorescent items—or even cut and polish specimens—this catalog is of vital importance to you. Do not take our word for it, however, but investigate it for yourself. Send for a copy TODAY—it will be sent you free of charge. We know you will be pleased with it.

Many dealers are reporting a brisk business lately due to personal visits of a large number of collectors. If you have not visited a dealer this year, take a day off before the snow sets in, and call on some of them. Have a copy of *Rocks and Minerals* with you as it contains the names and addresses of all the important mineral dealers in the country.

Clubs Affiliated With the Rocks and Minerals Association

ARIZONA

Mineralogical Society of Arizona
Geo. G. McKhann, Sec., 909 E. Willetta Street, Phoenix.
Meets at the Arizona Museum in Phoenix on the 1st and 3rd Thursday of each month.

CALIFORNIA

East Bay Mineral Society
Miss Marjory Welch, Sec., 3268 Central Avenue, Alameda.
Meets on the 1st and 3rd Thursdays of each month (except July and August), at 8:00 p.m., in the Lincoln School Auditorium, 11th and Jackson Sts., Oakland.

Northern California Mineral Society
A. L. Rogers, Sec., 137½ Joost Ave., San Francisco.
Meets on the 3rd Wednesday of the month at the Public Library in San Francisco.

Southwest Mineralogists
Mrs. Pearle Arnold, Cor. Sec., 2132 W. 76th St., Los Angeles.
Meets every Friday at 8:00 p.m. at Manchester Playground, 88th and Hoover Sts., Los Angeles.

COLORADO

Canon City Geology Club
F. C. Kessler, Sec., 1020 Macon Ave., Canon City.
Meets on the 1st and 2nd Saturdays of each month at 9:00 a.m. in the High School Building Canon City.

Colorado Springs Mineralogical Society
Lynn M. Hopple, Sec.-Treas., Motor Route 2, Colorado Springs.
Meets usually at the Lennox House, Colorado College Campus, Colorado Springs, on the 2nd Monday, of each month at 7:30 p.m.

CONNECTICUT

Bridgeport Mineral Club
Mrs. Julia Walker, Sec., 55 Eaton Street, Bridgeport.
Meets in the Bridgeport Public Library on the 3rd Monday of the month.

Long Hill Mineral Club
Eugene F. Robinson, Sec., R. F. D. No. 4, Box 237, Bridgeport.
Meets on the 4th Tuesday of each month at 8:00 p.m., in the Hawley Memorial Library, Long Hill.

Mineralogical Club of Hartford
Mrs. L. T. Goodrich, Sec., 51 Jerome Avenue, Bloomfield.
Meets the 2nd Wednesdays of each month, at 8:00 p.m., at 249 High St., Hartford.

New Haven Mineral Club
Mrs. Lillian M. Otersen, Sec., 16 Grove Place, West Haven.
Meets on the 2nd Monday of the month at the Y. W. C. A. on Howe St., New Haven.

IDAHO—OREGON

Snake River Gem Club
Margaret L. Hearn, Sec., Payette, Idaho.
Meets alternately in Payette and Ontario, Oregon, (two small cities on the Snake River) on the 3rd Tuesday of every month.

ILLINOIS

Junior Mineral League
E. Johansen, Sec., Morgan Park Junior College, 2153 W. 11th St., Chicago.

MAINE

Maine Mineralogical and Geological Society
Miss Jessie L. Beach, Sec., 6 Allen Avenue, Portland.
Meets last Friday of the month at 8 p.m., at the Northeastern Business College, 97 Danforth Street, Portland.

MARYLAND

Natural History Society of Maryland
2103 N. Bolton Street, Baltimore.
Office hours, Tuesdays and Fridays, 10:00 a.m. to 5:00 p.m.

MASSACHUSETTS

Connecticut Valley Mineral Club
Leo D. Otis, Sec., 12 Clark St., Westfield, Mass.
Meets on the 1st Tuesday of each month at 8 p. m. at various institutions in the Connecticut Valley.

MISSOURI

National Geologist Club
Mrs. D. P. Stockwell, Pres., Mt. Olympus, Kimmswick.

NEVADA

Reno Rocks and Minerals Study Club
Mrs. Rader L. Thompson, Sec., Box 349, R2, Reno.
Meets on the 1st Wednesday of each month, at 7:30 p.m., at the Mackay School of Mines, Reno.

Western Nevada Mineral Society
A. Cornely, Sec.-Treas., P. O. Box 21764, Reno.

NEW JERSEY

Newark Mineralogical Society
William E. Simpson, Sec. 308 Grove Street, Montclair.
Meets on the 2nd Sunday of the month at 3 p.m. at Junior Hall, corner Orange and North 6th Streets, Newark.

New Jersey Mineralogical Society
O. B. J. Fraser, Sec.-Treas., 27 Stoneleigh Park, Westfield.
Meets on the 1st Tuesday of the month at 8 p.m. at the Plainfield Public Library.

NEW MEXICO

New Mexico Mineral Society
R. M. Burnet, Sec.-Treas., Carlsbad.
Society of Archaeology, History and Art
Carlsbad.

NEW YORK

Chislers, The
Miss Evelyn Waite, Sponsor, 242 Scarsdale Road, Crestwood, Tuckahoe.

Queens Mineral Society
Mrs. Edward J. Marcin, Sec., 46-30—190th Street, Flushing.
Meets on the 2nd Thursday of the month at 8 p.m. at 289 Etna Street, Brooklyn.

OKLAHOMA

Oklahoma Society of Earth Sciences
W. P. Smiley, Sec.Treas., 229 W. Jefferson Street, Mangum.
Meets on the 2nd Tuesday of each month, at 7:30 p.m., at the Historical Museum, Mangum.

PENNSYLVANIA

Thomas Rock and Mineral Club
Mrs. W. Hersey Thomas, Pres., 145 East Gorgas Lane, Mt. Airy, Philadelphia.
Meets on the 3rd Friday of each month, at 8:00 p.m., at the home of its president, Mrs. Thomas.

VERMONT

Mineralogical Society of Springfield
Victor T. Johnson, Sec., 11 Elm Terrace, Springfield.
Meets on the 3rd Wednesday of each month at 8:00 p.m. at the homes of members.

WASHINGTON

Gem Collectors Club
Mrs. Lloyd L. Roberson, Sec., 522 North 70th Street, Seattle.
Meets on the 1st and 3rd Tuesday of each month (except during the summer) at 8:00 p.m., at the Y. M. C. A.

Washington Agate and Mineral Society
Monroe Burnett, Sec., 802 S. Central St., Olympia.
Meets on the 1st Monday of the month, at 7:30 p.m. at the home of some member.

Collectors' Kinks

CLEANING SAYREVILLE, N. J., PYRITES

Much has been discussed and written on the best method of preparing pyrite and marcasite specimens in order to prevent them from disintegrating and discoloring. I have collected specimens at Sayreville, New Jersey, many times and have found that while a few remain intact, most are subject to breakdown sooner or later. So far I have found the following proceedure most effective for preparing these specimens for permanence. When first received the clay and dirt should be removed from the specimen with live steam, with plenty of moisture and pressure. Finish the cleaning in alcohol and allow them to remain in the bright sunlight and dry. Finally dip them either in a light mixture of balsam and xylol or Dupont acetate lacquer. In either case make sure that the solution is quite thin. Finally suspend them in a dry place for several days.

I might add to the above that I have found several instances where these specimens disintegrate when they have been wrapped in paper for some time, and by the same token, that specimens collected at the same time and locality and kept on an open shelf were in perfect shape. Also care should be exercised in not allowing specimens to remain in damp basements.

JOSEPH D'AGOSTINO

CLASSIFIED ADVERTISEMENTS

WORLD'S BEST WANT AD. MEDIUM FOR MINERALS

Rate 5c per word; minimum 10 words. Remittance must accompany copy in all cases. Advertisers must furnish satisfactory references before their advertisements will be inserted. Forms close the 1st of every month.

BOOKS

Handbook For the Amateur Lapidary by J. H. Howard, 16 chapters covering all phases of gem cutting and polishing, 141 pp., 14 illus., price $2.00. J. H. Howard, 504 Crescent Ave., Dept. R., Greenville, S. C.

How to Collect Minerals. By Peter Zodac. A guide book for the collector. 80 pp., 15 ills., $1.00. Rocks and Minerals. Peekskill. N. Y.

Fifty Back Numbers of Rocks and Minerals Magazine, all in good condition and all different, $10.00. If you have back numbers send a list of them with your order and we will try not to duplicate any of them. Rocks and Minerals, Peekskill, N. Y.

"185 MINERALS—HOW TO IDENTIFY THEM" Properties, strategic minerals, testing methods, analysis, etc. Water-proof cover. 25c postpaid. Richard M. Pearl, 1539 Broadway, Denver, Colorado.

History and Geology of the Royal Gorge, an illustrated souvenir booklet with maps and drawings locating 54 minerals for touring collectors. 50c postpaid. F. C. Kessler, Canon City, Colo.

FOSSILS

Fossils, Minerals, Old Arms, Indian Beaded Trappings prehistoric specimens, general line of curios. Lists 10 cents. N. E. Carter, Elkhorn, Wisc

EXCHANGES

WANT TO EXCHANGE MINERALS. CAN OFfer fayalite, forsterite, thorite, triphyllite, heterosite, manganapatite for good specimens from other localities. Gunnar Bjareby, 147 Worthington St., Boston, Mass.

Wanted: Good specimens of fluorescent minerals, good crystals of all minerals, good specimens of beryllium minerals. We will trade fine specimens from our lists. The Cooperative Mineral Exchange, 79 Goffe St., New Haven, Conn.

Would Like to Exchange Minerals with other collectors. Correspondence invited. William F. Haeberle, R. F. D. 1, Box 110, Telford, Penna.

MINERALS

Millerite from Milwaukee, Wisconsin. Benedict P. Bagrowski, 1014 Vt., Lawrence, Kansas.

Beautiful Opals-Direct from Australia. Lapidaries Parcel, 10 ounces cutting opal, (about 50 stones) $10.00. Collectors specimens—good attractive parcels, $5.00 $10.00 Dozen small black opals $5.00. 10 ounces small opal chips $5.00. Illustrated catalogue No. 47 free. Natural History Books (thousands), lists free. Norman Seward, "Opal House," Melbourne, Australia.

MINERALS

Minerals, Fossils, Indian Relics, Books, Coins, Curios, Stamps. Old Glass. Catalogue 5c. Indian Museum, Osborne, Kansas.

Scott Rose Quartz Co.—Rose Quartz, Black Hills specimens, all kinds and colors; for rock gardens, cabinets, etc. Boxes: 24 specimens, $1.00; 18 specimens, 50c; 15 specimens, 35c. Postage paid. Box 516, Custer, S. Dak. Send stamp for price list.

Utah Jewels: New Calcites, 75c to $5.00. Superb Quartz & Pyrites. 50c to $5.00. Limited. The Berryman Menage, 412 East 9th South, Salt Lake City, Utah.

New England minerals for sale or exchange. Correspondence solicited. Rudolf C. B. Bartsch, 36 Harrison St., Brookline, Mass.

Mineral Specimen Cabinets—15 to 100 specimens. Prices 35c to $10.00. Cabinet specimens—free price list. Charles O. Scott, 739 Colorado Ave., Trinidad, Colorado.

PYROMORPHITE—Green xls encrusting quartz, 10c to $1.00. Dekro Mineral Company, 7029 Lincoln Drive, Philadelphia, Pennsylvania.

Beautiful blue and brown chalcedony, red jasper, calcite and onyx, vari-colored conglomerates and breccias, and many other beautiful minerals. A nice assortment for $1.00. John Jennings, Eureka Springs, Ark.

Gem quality Washington carnelian, beautifully polished slabs, 15c per square inch. Unpolished 10c. Harry Fritz, 707 N. 65th St., Seattle, Wash.

Mexican Fire Opal Cabochons—3 for 25c. Wendell Stewart, 108 Colorado, Monrovia, California.

FLUORESCENT MINERALS

Franklin, N. J., Fluorescent Minerals, 10 specimens, $2.00, plus postage. Average size 2x2. Send for list. John Albanese, P. O. Box 281, Newark, N. J.

Snow White Calcite—Fluoresces green. Rare. Few pieces available, 3x4—$3.00. Hurry if you want one. Couple museum specimens. Dr. R. E. Anderson, Box 575, Deming, New Mexico.

Fluorescent calcite mixed with sphalerite and galena. I have been mining specimens for ten years and this is the only calcite I have found which will fluoresce under the black bulb or quartz light and only a small quantity available. For sale or trade for good willemite or wernerite. J. A. Robertson, Box 105, Baxter Springs, Kansas.

SPECTROSCOPES

Spectroscope For Quick Ore Analysis $2.50. Cuffing Sons, Campbell, Calif.